on the expected propagation of the PCS facility, a calculation affected by the height and transmit power of the facility. However, the minimum coordination distance in the table, 201 kilometers, assumes a 10 Watt EIRP transmitter operating at an antenna height of 90 meters.

As noted in the comments, however, the benefits of microcellular architectures will lead to significantly lower PCS facility powers and heights. Accordingly, Motorola submitted a revised coordination table that extended down from the Commission's original proposal to minimum heights of 5 meters and minimum power levels of 1 Watt EIRP, resulting in a minimum coordination distance of 83 kilometers. Given the density of existing microwave facilities in certain parts of the country, reducing the coordination burden on PCS licensees will result in significant cost and time savings. At the same time, however, the coordination distances continue to reflect accurate assumptions regarding the potential for interference.

B. Continued Reliance On Carey Contours for Predicting 2 GHz Propagation Is Unjustified

In a related matter, the Commission has proposed to use a 47 dBu Carey contour to define the reliable service area of a PCS licensee. While Motorola, and others, have supported the use of a 47 dBu contour,[34] stringent opposition to the

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[34] Motorola at 39; CNet at 3-4; PacTel at 41-42; Sprint at Appendix A p. 4.

continued use of the Carey methodology for predicting this contour was expressed.[35] The Carey approximations were derived from data originally based on propagation measurements taken in the VHF and low UHF bands, and thus their applicability at 2 GHz must be questioned as sound engineering practice. Motorola consequently joins with other parties in recommending the use of a more accurate propagation model, such as Hata or more current CCIR recommendations.

C. PCS Will Benefit From Interoperability Capabilities

The opening comments generally support the Commission's intent to fashion "a technical framework that will permit significant flexibility in the design and implementation of PCS systems, devices, and services."[36] There is a wide belief among the telecommunications industry, however, that standards for nationwide roaming compatibility and interoperability requirements between PCS systems are essential for consumer acceptance of PCS.[37] Indeed, "a certain degree of interoperability and roaming would seem to be necessary for the type of ubiquitous PCS service the Commission envisions."[38]

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[35] Motorola at 40; APC at 59; CNet at 3-4.

[36] Notice at 5716-5717.

[37] BellSouth at 27-30; Cellular Comm. at 29; Cellular Service at 5; Centel at 32; Comsat at 3; Corporate Technology Partners at 11-15; Cox at 26-29; DBX at 12; Ericsson at 23; Florida Cellular at 16; MCI at 10-11; Metrocall at 18; Manager of National Comm. Systems at 3, 4; PacTel at 46; Rochester Telephone at 29; Rock Hill Telephone at 3; Southwestern Bell Telephone at 28; TIA at 5-6; USTA at 36-37; U S West at 18-22; UTC at 41-42.

[38] UTC at 41-42.

"Interoperability will permit customers to use their PCS devices from any location where PCS is offered, regardless of the provider."[39] Thus, PCS users will not only be able to roam from one region to another, but also between competitive operators within the same region, thereby furthering the Commission's goals of universality and competitive delivery. Moreover, interoperability will speed deployment and promote a wide array of services by "encourag[ing] diverse equipment suppliers and PCS providers to enter the market, since the equipment and service capabilities could be utilized anywhere."[40] As USTA notes, "[c]ommon air interface standards [also] are necessary . . . to allow users to change providers without changing handsets, to foster manufacturing economies of scale, to enable more efficient spectrum assignments and to promote competition."[41] In contrast, proprietary standards are likely to develop in the absence of CAI's -- keeping prices artificially high, and even more importantly, slowing deployment and eliminating universality.[42]

As Motorola and others have noted, however, development of a single mandatory PCS standard is also likely to deter flexibility in choosing differing

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[39] USTA at 36.

[40] Id.

[41] Id., citing remarks of Donald C. Cox, En Banc hearing on Personal Communications Services, before the Federal Communications Commission, December 5, 1991 at 9.

[42] BellSouth at 27-28.

technologies and to delay initiation of PCS.[43] Thus, the Commission should encourage industry efforts to develop a limited number of CAI's which provide for various technologies. Several groups have already shown significant progress in developing CAI standards.

In this regard, Telocator, CTIA, T1, the technical committee of the Exchange Carrier Standards Association, and TIA's Subcommittee TR45.4 on Microcell and PCS standards regularly engage in coordination meetings to advance standards work and have detailed their efforts to co-sponsor a "Joint Experts" meeting on radio interfaces and related areas.[44] In addition, TIA has recently expanded its structure to create a new section specifically targeted toward PCS standards at 1.8 GHz. Motorola, an active participant in these organizations, fully supports their endeavors. "PCS should not be relegated to islands of service operating on incompatible and proprietary bases."[45] Accordingly, Motorola urges the Commission to encourage the ongoing efforts of such groups to develop needed common protocols and common air interfaces for various PCS technologies.

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[43] TIA at 5.

[44] Telocator at 15-19, Appendix C. See also TIA at 6.

[45] Centel at 32.

IV. THE RECORD SUPPORTS DEVELOPMENT OF POLICIES AND RULES PROMOTING RAPID INTRODUCTION OF NEW UNLICENSED PCS DEVICES

A. The Comments Support Creating a New Entity To Manage Band Clearing for New Unlicensed Devices

The Commission proposes to allocate the 1910-1930 MHz band for use by unlicensed devices on a shared basis with existing 2 GHz fixed microwave licensees.[46] The Commission also articulated requirements for relocating incumbent licensees of this band to different frequencies. Nonetheless, several difficult matters remain unaddressed.

In their opening comments, Motorola and several other parties identified the need for manufacturers of unlicensed devices operating in the 1910-1930 MHz band and the Commission to develop an effective mechanism for effectuating the relocation of incumbent 2 GHz microwave licensees. In particular, Motorola proposed the establishment of a consortium composed of unlicensed device manufacturers who would contribute to a compensation pool to fund relocation. Such a consortium would operate under ground rules that ensure open entry for all manufacturers and that require all manufacturers marketing unlicensed PCS devices to participate in microwave relocation costs. It would provide a means by which 2

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[46] Redevelopment of Spectrum to Encourage Innovation in the Use of New Telecommunications Technologies, (First Report and Order and Third Notice of Proposed Rule Making) ("Order and Notice") 7 FCC Rcd 6886, 6892 (1992).

GHz licensees could be promptly and equitably relocated, and new services could be rapidly deployed.

The formation of a single entity for this purpose presents a number of potential benefits. First, it would realize efficiencies and economies both in negotiating to clear the spectrum and in acquiring the equipment and services necessary for relocation of the existing licensees. Second, it would facilitate the resolution of disputes, whether arising from relocation issues or interference concerns. Finally, it would create a more attractive vehicle for the financing required to accomplish these objectives.

Thus, it is not surprising that there appears to be support for the establishment of an industry-wide mechanism to coordinate the relocation and compensation of 2 GHz licensees such as that proposed by Motorola. Many parties support Motorola's specific consortium approach.[47] Others favor an additional charge on unlicensed PCS devices to compensate incumbent users, or other compensation methods.[48] While there may be diverging viewpoints[49] and

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[47] See, e.g., Edison Electric Institute at 5 (supporting mandatory consortium of manufacturers/vendors that guarantees costs of relocation prior to FCC certification); Rolm at 21-22 (PCS trade association empowered by FCC to collect transition royalty and possibly arbitrate PCS disputes); UTC at 19 (supporting an FCC mandated consortium of PCS manufacturers/vendors to pay relocation costs).

[48] See, e.g., AT&T at 13-14 (funding mechanism based on fees related to spectrum bandwidth); Pennsylvania Public Utilities Commission at 10 (additional charge on unlicensed PCS devices to compensate incumbent users).

[49] A small minority of commenting parties opposed any such compensation mechanism. See, e.g., Southwestern Bell at 31-33; Public Safety Microwave Committee at 7. These parties overtly reject relocation of incumbent 2 GHz fixed microwave services and thus, do not devote much attention to a discussion of compensation mechanisms. While Motorola sympathizes with their

a variety of competing concerns to be addressed, Motorola submits that, as set out in more detail below, an unlicensed devices consortium is the best possible solution within the general framework proposed by the Commission.

1. Assessment of Relocation Requirements Under the FCC's Proposed Plan

In setting forth a more comprehensive and detailed proposal for satisfying the relocation and other requirements for implementation of the Commission's proposals for unlicensed devices in the 2 GHz band, it is necessary first to assess the magnitude and scope of the task facing the Commission and the parties to this proceeding.

a. Current usage of the 1910-1930 MHz band

In assessing the magnitude of the relocation issue, the obvious starting point is the identification of the incumbents. As detailed in our original comments, there are currently over 200 licensees operating 452 stations between 1910 and 1930 MHz. More than half of these facilities are located in Texas, California, Louisiana, or the Gulf of Mexico. However, the remainder are spread throughout the country.

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concern for protecting the integrity of fixed microwave services, it believes that ample scientific and technical studies concerning the reliability of their proposed relocation should put such fears to rest. Given that the Commission has already expressed its commitment to expediting the delivery of new PCS services to the public, Motorola respectfully submits that it may be far more fruitful to address the realities of relocation and design a mechanism to relocate those fixed 2 GHz users as equitably and efficiently as possible.

Of the 452 existing links, 357 are non-public safety links potentially subject to involuntary relocation under the Commission's Emerging Technology decisions. The other 95 links are state and local government systems currently exempt from involuntary relocation. In any case, the involuntary relocation process defined in the Commission's Emerging Technology decision does not support rapid deployment of PCS unlicensed devices. Therefore, the industry and the Commission must develop some mechanism to coordinate unlicensed operation around microwave links and/or to reaccommodate these links in alternative bands.

b. FCC framework for relocation

The Commission's plan for relocating incumbent 2 GHz fixed microwave licensees has two parts. First, during a "transition period," all existing fixed microwave licensees are encouraged, but not required, to negotiate voluntary relocation agreements with emerging technologies providers.[50] Any such agreements, if consistent with the Commission's rules, will be accommodated.

Second, after the transition period, existing fixed microwave licensees -- except for operators licensed to the public safety and special emergency radio services, "including state and local governments, police, fire, and medical

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[50] The Commission solicited comment on the length of the transition period, tentatively concluding that it should be in the range of three to ten years, commencing on the adoption date of the Report and Order on the Notice addressing the re-channelization of the higher frequency microwave bands for incumbent 2 GHz fixed microwave licensees. With respect to the 1910-1930 MHz band, however, the FCC asked whether any transition period is necessary.

emergency communications" -- are subject to case-by-case involuntary relocation.[51]

Under the involuntary relocation approach defined by the Commission, the entity requesting relocation must:

- Guarantee payment of all relocation costs, including all engineering, equipment, site and FCC fees, as well as any reasonable additional costs that the microwave licensee may incur as a result of operation in a different band or migration to other media;

- Complete all activities necessary for the implementation of the new facilities, including identification and procurement of new microwave frequencies or other facilities and engineering, frequency coordination, and cost analysis of the complete relocation procedure; and

- Build the new microwave system or its alternative and test for comparability to the existing 2 GHz system.

The incumbent fixed microwave licensee would be afforded a reasonable time to relocate after the comparable facilities are available. In addition, the Commission's Emerging Technology decision states that if the new facilities are demonstrated to be "not comparable" within one year after operation has begun, the emerging technology service provider must remedy any deficiencies or finance the return of the fixed microwave licensee to its former 2 GHz frequencies.

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[51] The Notice seeks comment on whether a minimum time period for voluntary negotiations is needed after the grant of a license to a new service provider to protect an incumbent 2 GHz licensee from a sudden or unexpected request for involuntary negotiations.

c. Interference rights

During the transition period (and after, for public safety licensees), incumbent fixed microwave licensees enjoy "co-primary" status with emerging technology uses. However, the Commission stated that, in case of interference between co-primary emerging technology users and fixed microwave licensees, the "facility first licensed will be afforded interference protection from the offending facility."[52] As a practical matter, then, incumbent fixed service licensees must be afforded protection by unlicensed devices, since the fixed users are pre-existing.

The matter of interference protection is complicated by certain confusing statements in the Order and Notice. Specifically, the language contained in the Order and Notice could be read to suggest a different standard for retaining primary status for major extensions of existing 2 GHz facilities than was specified in the May 14, 1992 Public Notice. Likewise, the decision suggests that the Commission is soliciting comment on the primary licensing policy for fixed microwave facilities. It is Motorola's understanding from the FCC staff that the policy concerning primary licensing for 2 GHz frequency and path additions has not been changed.[53]

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[52] Order and Notice at 6890 n.34.

[53] Erratum to First Report and Order and Third Notice of Proposed Rule Making (FCC 92-437) in ET Docket 92-9, released October 29, 1992.

d. Estimated relocation costs

In the Order and Notice, the FCC estimated that the relocation of incumbents would cost approximately $100,000 per licensee installation. In its opening comments, however, Motorola identified additional costs that would also have to be included in any such estimates. Set forth below is Motorola's best estimate of the per-link cost of relocating incumbent licensees in the 1910-1930 MHz band, based on the factors identified by the FCC and other parties. The costs for new equipment and frequency coordination are taken directly from OET's January 1992 Emerging Technology Report. These are supplemented by estimates for engineering costs, filing fees, preparation of applications, and negotiations, which OET did not consider. We have not included OET's estimates of the remaining value of existing microwave facilities. As new entrants will bear the cost of replacement systems, microwave users face no penalty for retiring existing systems earlier than planned. To the contrary, the reimbursement to replace a microwave system might be reduced by any remaining or salvage value of the existing equipment.

Cost of new 4-6 GHz equipment:	$125,000
Frequency coordination:	300
Engineering (design, installation and testing):	5,000
Filing fee:	155
Preparation of application:	1,500
Negotiations:	[54]1,500
Other zoning permits:	2,000
	$135,455

Assuming a per-link relocation cost of $135,455, the total costs of relocating 357 links would be approximately $48.4 million. Relocating the remaining 95 links would add $12.9 million -- or more, if these licensees demand a premium, since they are not required to move -- for a total relocation cost of at least $61.3 million.[55]

It should be noted that even this estimate may be low for several reasons. First, it assumes all the existing links are one-way. In reality, many of the links are two-way. Of course, if the return link is in a different band, the relocation costs, if any, might be assumed by an entity other than manufacturers of unlicensed devices. Second, in some cases, the new facilities may require use of a high

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[54] The cost of negotiations will vary with the number of licensees, not the number of links. The per-link costs is derived by assuming that negotiation costs will be $3000 per licensee and that each licensee operates two links.

[55] Band clearing for the entire country is necessary for effective introduction of new unlicensed device offerings. The buyers or users of equipment control where and how the devices are used which means that a phased in approach with market entry focusing on specific cleared markets generally is not possible. Consumers can and will take and use equipment outside the initial installation area despite the best intentions and best efforts of a manufacturer. There may, however, be some limited situations for large campus business installations where operation could commence on a shared frequency coordinated basis with little likelihood of rogue roaming. However, overall there is a constant threat of interference to 2 GHz operations unless and until all current microwave users are migrated to other bands.

performance antenna and structural improvements. OET estimates these costs as $25,000. Third, this analysis does not include costs associated with dispute resolution. The magnitude of these costs will depend on the dispute resolution mechanism. Fourth, the estimate does not include possible premiums for early relocation. Fifth, no allowance is made for the costs of improving new facilities or moving fixed licensees back to the 2 GHz band if, after one year, the new facilities are not comparable.

2. Issues To Be Resolved In Relocating Incumbent Licensees To Permit Use of the 1910-1930 MHz Band By Unlicensed Devices

The opening comments in this docket demonstrate that moving existing licensees out of the 1910-1930 MHz band in order to make the frequencies available for unlicensed devices will raise a number of complex issues. These problems may be grouped into three general categories: the structure of the compensation mechanism; negotiation and implementation concerns; and, protection of existing and exempt 2 GHz licensees from harmful interference. Each is addressed below.

a. Structure of the compensation mechanism

As discussed above, the estimated costs of relocating incumbent 1910-1930 MHz licensees will be at least 61.3 million dollars. Developing a mechanism

for collecting the funds necessary to compensate existing users will raise the following issues:

Identification of the entity responsible for negotiations. It would be impractical for each individual manufacturer of unlicensed devices to negotiate with each current private microwave licensee. Rather, a single entity might assume responsibility for negotiating with incumbent users and raising and disbursing the money to pay for the relocation. This entity should be representative of the entire range of unlicensed device manufacturers.

Raising money to cover relocation costs. An equitable mechanism must be developed for funding the costs of compensating incumbent licensees. This mechanism must accomplish several goals:

- It should ensure that sufficient money is raised to support the relocation;
- It should ensure participation by all manufacturers of unlicensed devices;
- It should be open to all manufacturers and must establish a system of financial contributions that does not inadvertently preclude participation by smaller entrants; and
- It should ensure that providers of the initial contributions pay no more than their fair share and do not subsidize later emerging technologies entrants.

b. Negotiation and implementation issues

The negotiation of relocation costs with individual licensees, and the actual transition to the new frequencies, will raise numerous issues:

Ascertaining the costs of relocation. Although the FCC has specified that incumbent licensees must be reimbursed for the costs of relocation, this requirement undoubtedly will lead to numerous controversies in practice. For example, what is the remaining value of their existing facilities? If so, how should this value be determined -- based on replacement costs, book value, market value, or some other measure? In addition, will incumbent users routinely demand and be eligible for upgrades, such as structural improvements and high performance antennae? What are reasonable zoning costs, where re-zoning is needed?

Assessing comparability. In the case of involuntary relocations the Commission has directed that incumbent users be provided with comparable facilities, and has provided that if the new facilities are not comparable one year after relocation, they may be made comparable or the user may be returned to its original spectrum home. How will comparability be assessed, both initially and after one year?

Dispute resolution. Inevitably, there will be disputes regarding the sufficiency of the relocation package and the comparability of the new facilities. A mechanism must be developed for equitably and expeditiously resolving such disputes.

Zoning issues. Relocation of users may require the construction of new antennae or movement of old ones. Modifications to old sites and development of new sites may need zoning approvals. Emerging technology providers and existing licensees will need to cooperate in accommodating zoning authorities. Commission involvement may be necessary to avoid frustrating the agency's policies favoring the rapid deployment of new technologies.

c. Protecting existing licensees from interference

Because unlicensed devices are inherently mobile, they may be moved from their original location. Such moves could cause interference both to co-primary fixed service licensees who have not yet relocated and to exempt public safety users, who retain co-primary status indefinitely. A mechanism will be needed to protect these licensees from interference if the band is not fully cleared.

3. Proposed Model For Compensating Incumbent Licensees

As noted above, the opening comments in this docket demonstrate widespread agreement that the mechanism for compensating and relocating incumbent 1910-1930 MHz licensees must attract sufficient money to pay all relocation expenses, make certain that no manufacturer that wants to build such equipment is unfairly foreclosed from doing so, ensure that all manufacturers that wish to build equipment for this frequency band pay an equitable share of the

relocation costs, and provide for prompt resolution of disputes. Based on these requirements, Motorola proposes the establishment of a not-for-profit entity, such as a consortium or non-stock membership corporation, to conduct negotiations with incumbent fixed service licensees and oversee their relocation.[56] The entity might work as follows:

a. Benefits of a single entity

The opening comments indicate support for the creation of a single, industry-wide mechanism to negotiate and coordinate the relocation of incumbent licensees and ensure an equitable allocation of the costs of the relocation.[57] A not-for-profit entity representing potential manufacturers of unlicensed devices would be established to assume responsibility for negotiating with incumbent users and to raise and disburse the money to pay for their relocation. This entity would act as the overall coordinating body for relocating and compensating incumbent licensees. It would operate on a not-for-profit, cost recovery basis only.

There are several reasons for establishing a single entity to perform these functions. Most importantly, a single entity would achieve efficiencies and

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[56] Of course, implementation of the consortium would require adoption by the FCC of appropriate rules and policies. Because the consortium approach raises some novel questions, its feasibility cannot be determined until it has been explored with the agency's staff.

[57] See, e.g., Edison Electric Institute at 5 (supporting mandatory consortium of manufacturers/vendors that guarantees costs of relocation prior to FCC certification); Rolm at 21-22 (PCS trade association empowered by FCC to collect transition royalty and possibly arbitrate PCS disputes).

economies of scale that could not be realized without such centralization. A decentralized approach, on the other hand, would result in redundant efforts, waste, and free rider problems.

- It would be impractical and inefficient for each individual manufacturer of unlicensed devices to negotiate with each current private microwave licensee. Moreover, later manufacturers of unlicensed devices would receive, free of cost, the benefits of the negotiating efforts of the earlier manufacturers. Accordingly, a single entity would help reduce agency costs while ensuring an equitable distribution of the costs of relocation.

- A single entity could produce further savings by making bulk purchases of the equipment and/or services needed to relocate the incumbent licensees and to test the new locations for comparability.

- Having a single entity as the focal point of the relocation efforts would also facilitate the prompt resolution of any disputes that should arise between incumbent licensees and the manufacturers of unlicensed devices. The single entity would be able to devise streamlined, effective dispute resolution mechanisms backed by the FCC. Moreover, a single entity, represented by a single counsel, would be able to avoid the excessive, and unnecessarily redundant, legal fees inherent in multi-party disputes.

- A single entity representative of the entire range of unlicensed devices manufacturers would also be able to attract more easily the capital necessary to cover the costs of relocation. A single entity comprised of the participants in the spectrum would be more attractive to banks and other creditors.

In addition, a single entity would more effectively protect fixed service licensees from harmful interference. The entity, for example, could be given a frequency coordination role in order to minimize harmful interference to co-primary fixed 2 GHz licensees. The entity would also keep track of and publicize the locations of remaining fixed links in the 1910-1930 MHz band. The entity also

could further explore with manufacturers the viability of automated interference protection systems.

b. Financing the entity

The new entity would have to raise enough capital to begin negotiating with, and compensating, existing licensees in the 1910-1930 MHz band. Companies planning to manufacture unlicensed devices using that spectrum would provide the initial capital, either in the form of cash or cash equivalents (i.e., equity in the entity), or debt. For example, debt could be incurred through a line of credit secured on a pro rata basis by standby letters of credit obtained by the participants in the entity. The available funds could then be administered -- potentially under a trust or comparable agreement -- for the purpose of reimbursing the relocated licensees as discussed in more detail below.

Subsequent payments to the entity, such as the alternatives discussed below, could be used to reimburse the initial contributors or retire the debt, as appropriate. To create an incentive to participate in providing the initial capital, parties ultimately determined to have made disproportionate contributions may later be reimbursed at an above-market interest rate. Such incentives, however, would raise the issue of taxable earnings, an issue that the parties will explore further.

c. Cost recovery mechanism

There are several options for a cost recovery mechanism to provide reimbursement of the initial capital contributions, whether in the form of debt or equity. First, the entity could charge a surcharge, which could be either a flat rate per item of equipment or a percentage of the sales price. Each manufacturer (including the initial contributors) would be responsible for forwarding the surcharge amount to the entity. The entity would periodically apportion these funds among the initial contributors until they have been compensated, with interest. At that point, the surcharge would be discontinued (or reduced, if the entity is to have any continuing role).

A surcharge that is based on revenues from equipment sales would appear to provide an equitable means of apportioning the costs of the relocation. This option would generate a stream of payments to the initial contributors (rather than a single annual payment) and would avoid the need to estimate future sales. Moreover, a surcharge based on sales revenues rather than a flat fee would make it easier for smaller manufacturers to participate. Smaller, start-up ventures may not be able to raise sufficient funds to pay a substantial flat fee.

Alternatively, any manufacturer seeking to sell equipment for operation in the band could be required to pay an annual membership fee based on its estimated sales of unlicensed devices in the upcoming year. At the end of each year, the estimate would be compared to actual sales and a payment reconciliation

would occur. Once the initial contributors have been compensated, this annual fee could be eliminated or, if the entity is to have any continuing role, reduced.

This approach also appears equitable. It has the advantage of providing funds to the initial contributors more quickly. On the other hand, it has the disadvantage of the added administrative costs inherent in estimating future sales and reconciling those estimates against actual revenues.

d. Form of the entity

As indicated in the opening comments, the single entity could take any one of a number of forms. The ultimate choice of entity will depend on a number of factors, including considerations of liability, management and control, and tax exposure, to be worked out by the parties involved. The options include a stock or non-stock not-for-profit corporation, a limited partnership or a limited liability company, and a self-regulating organization.

The membership rules and operating procedures of the entity would ensure the participation of any prospective providers of unlicensed devices willing to pay an equitable share of the relocation costs. All participants in the entity would be required to commit to abide by all applicable FCC rules.

e. FCC authority to require a single entity

The FCC should help ensure that all providers of devices operating in the 1910-1930 MHz band contribute to recovering the relocation costs by requiring participation in a mechanism to reimburse the initial contributors to the entity. There are three approaches that the Commission could take to ensure that all unlicensed device manufacturers participate in the entity.

Frequency coordinator approach. Section 332(b) of the Communications Act authorizes the Commission, in coordinating the assignment of frequencies to stations in the private land mobile services and in the fixed services, to utilize assistance furnished by advisory coordinating committees composed of individuals who are not officers or employees of the federal government. These frequency coordinators, as they are more commonly known, provide frequency coordination on a non-discriminatory basis, check applications, file application and handling returns, facilitate the introduction of new technologies, manage post-licensing conflicts, and handle interservice sharing requests.[58] Since unlicensed PCS services are arguably "private land mobile radio services"[59] within the meaning of the statute, it appears that Section 332(b) may serve as explicit legal authority for

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[58] See Frequency coordinators in the private land mobile services, 103 FCC 2d 1093, *modified* 61 Rad. Reg. 2d (P&F) 148 (1986).

[59] Unlicensed PCS devices would appear to qualify as "private land mobile radio services" within the meaning of § 332. See 47 U.S.C. § 153(gg) (1988) (defining private land mobile radio services).

the establishment of an entity modeled along the lines proposed by Motorola. Alternatively, the broad rulemaking powers conferred upon the Commission by the Communications Act provide an independent source of authority for the establishment of such an entity. The frequency coordinator approach may be particularly attractive as some unlicensed operations might be initiated during the microwave clearing process if the coordinator could ensure non-interference to existing microwave operations. Notably, the coordinator's responsibility would be to ensure compatibility between unlicensed PCS devices and microwave operations. Compatibility among unlicensed PCS devices of various manufacturers would be handled by the "etiquette" being developed by industry rather than by the coordinator.

Type acceptance approach. Alternatively, the Commission could condition grants of type acceptance (or other form of equipment authorization) on receipt of certification from the consortium that a manufacturer has agreed to participate in the consortium in addition to meeting applicable technical standards. In order to receive FCC authorization, radio frequency devices must meet technical standards designed to promote the efficient use of radio spectrum and to minimize the possibility of interference between services.[60] In addition to technical standards provided, the rules governing the service may require that such equipment be verified by the manufacturer, or that the equipment receives an equipment

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[60] See 47 C.F.R. § 2.901 et seq.

authorization from the Commission via type approval, type acceptance, certification, registration, or notification.

Single licensee approach. The Commission could allocate 1910-1930 MHz of spectrum to a single licensee,[61] subject to the condition that the winning applicant allow all individual manufacturers to operate under the license as a participant in the industry-wide entity described above. Such a license would be awarded through the comparative hearing process.[62] Since timely deployment of PCS is clearly in the public interest and is a Commission priority, expedited comparative hearings would be required to implement this approach.[63]

In fact, Motorola believes that the concerns expressed regarding the delays inherent in comparative hearings are largely illusory. The Commission would be acting well within its authority in establishing eligibility criteria for applicants that would, as a practical matter, likely limit the number of competing applications. For example, an applicant could be required to operate on a non-profit basis, permit all eligible manufacturers to participate, demonstrate the financial capability to fund

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[61] There is ample precedent for the licensing of a single applicant in the land mobile communications context. For example, in the private land mobile services area, the FCC has eliminated end-user licensing in all but a few situations. End-users currently may operate under the blanket license issued to an SMR base station licensee. Similarly, the master licensee concept is employed in the cellular and radio common carrier (mobile phone) contexts.

[62] 47 U.S.C. § 309(e) (1988).

[63] The validity of expedited comparative hearings has been widely upheld by the Commission and courts as a lawful and rational means of streamlining time consuming proceedings. See, e.g., Cellular Mobile Systems of Pennsylvania v. FCC, 782 F.2d 182 (D.C.Cir. 1985)(upholding application of streamlined procedures adopted by Commission for explicit purpose of expediting cellular proceedings).

relocation and other costs, and comply with all FCC rules and regulations concerning the implementation of the spectrum clearing program and any other role the entity will play. Under these circumstances, it would not be surprising if the industry coalesces behind a single applicant.

Individual manufacturers would be required to become members of the licensee entity before selling devices for use in the band. To become a member of the licensee entity, a manufacturer would have to certify that it will participate in the cost recovery mechanism established by the entity. Membership in the licensee could be renewed annually based on continued participation.

The FCC's broad general rulemaking authority under the Communications Act should be adequate to establish such an entity. The Commission "may perform any and all acts, make such rules and regulations, and issue such orders, . . . as may be necessary in the execution of its functions."[64] Moreover, the Commission is empowered to "[m]ake such rules and regulations and prescribe such restrictions and conditions, not inconsistent with law, as may be necessary to carry out the provisions of this chapter. . . ."[65]

Case law supports an expansive interpretation of the Commission's rulemaking authority, particularly in the context of the promotion and

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[64] 47 U.S.C. § 154 (i) (1988).

[65] 47 U.S.C. § 303 (r) (1988).